What is claimed is:

1. A magnetic transducer comprising:

a nonmagnetic layer having a pair of surfaces opposing each other;

a soft magnetic layer formed on one surface of the nonmagnetic layer;

a ferromagnetic layer formed on the other surface of the nonmagnetic layer; and

an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer,

wherein an interlayer is formed in a layer which is at least either the soft magnetic layer or the ferromagnetic layer,

the interlayer has magnetism and has higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed, and

the interlayer contains at least one element in a group consisting of manganese (Mn), chromium (Cr), nickel (Ni), copper (Cu), rhodium (Rh), iridium (Ir) and platinum (Pt).

2. A magnetic transducer according to claim 1, wherein a thickness of the interlayer is from 0.5 nm to 1 nm inclusive.

3. A magnetic transducer according to claim 1, wherein the interlayer contains at least one element in a group consisting of oxygen (O)

and nitrogen (N).

4. A magnetic transducer according to claim 1, wherein the interlayer contains at least one of elements which are contained in the layer in which the interlayer is formed.

5. A magnetic transducer according to claim 1, wherein the soft magnetic layer has a first soft magnetic layer containing at least nickel in a group consisting of nickel, cobalt (Co), iron (Fe), tantalum (Ta), chromium, rhodium, molybdenum (Mo) and niobium (Nb), and a second soft magnetic layer containing at least cobalt in a group consisting of nickel, cobalt and iron.

6. A magnetic transducer according to claim 1, wherein the ferromagnetic layer contains at least cobalt in a group consisting of cobalt and iron.

7. A magnetic transducer comprising:

a nonmagnetic layer having a pair of surfaces opposing each other;

a soft magnetic layer formed on one surface of the nonmagnetic layer;

a ferromagnetic layer formed on the other surface of the nonmagnetic layer;

an antiferromagnetic layer formed on the ferromagnetic layer on

the side opposite to the nonmagnetic layer;

an interlayer formed in a layer which is at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed; and

an inserted layer formed at least either between the interlayer and the nonmagnetic layer or on the side opposite to the nonmagnetic layer with respect to the interlayer, the inserted layer containing at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and platinum.

8. A magnetic transducer according to claim 7, wherein a thickness of the inserted layer is more than 0.03 nm and less than 0.6 nm.

9. A magnetic transducer according to claim 7, wherein a thickness of the interlayer is from 0.5 nm to 1 nm inclusive.

10. A magnetic transducer according to claim 7, wherein the interlayer contains at least one element in a group consisting of oxygen and nitrogen.

11. A magnetic transducer according to claim 7, wherein the interlayer contains at least one of elements which are contained in the

layer in which the interlayer is formed.

12. A magnetic transducer according to claim 7, wherein the soft magnetic layer has a first soft magnetic layer containing at least nickel in a group consisting of nickel, cobalt, iron, tantalum, chromium, rhodium, molybdenum and niobium, and a second soft magnetic layer containing at least cobalt in a group consisting of nickel, cobalt and iron.

13. A magnetic transducer according to claim 7, wherein the ferromagnetic layer contains at least cobalt in a group consisting of cobalt and iron.

14. A magnetic transducer comprising:

a nonmagnetic layer having a pair of surfaces opposing each other;

a soft magnetic layer formed on one surface of the nonmagnetic layer;

a ferromagnetic layer formed on the other surface of the nonmagnetic layer;

an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer;

an interlayer formed in at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed; and

a thermal stabilization layer formed at least either between the interlayer and the nonmagnetic layer or on the side opposite to the nonmagnetic layer with respect to the interlayer.

15. A magnetic transducer according to claim 14, wherein a thickness of the interlayer is from 0.5 nm to 1 nm inclusive.

16. A magnetic transducer according to claim 14, wherein the interlayer contains at least one element in a group consisting of oxygen and nitrogen.

17. A magnetic transducer according to claim 14, wherein the interlayer contains at least one of elements which are contained in the layer in which the interlayer is formed.

18. A magnetic transducer according to claim 14, wherein the soft magnetic layer has a first soft magnetic layer containing at least nickel in a group consisting of nickel, cobalt, iron, tantalum, chromium, rhodium, molybdenum and niobium, and a second soft magnetic layer containing at least cobalt in a group consisting of nickel, cobalt and iron.

19. A magnetic transducer according to claim 14, wherein the ferromagnetic layer contains at least cobalt in a group consisting of cobalt and iron.

20. A thin film magnetic head having a magnetic transducer, the magnetic transducer comprising:

a nonmagnetic layer having a pair of surfaces opposing each other;

a soft magnetic layer formed on one surface of the nonmagnetic layer;

a ferromagnetic layer formed on the other surface of the nonmagnetic layer; and

an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer,

wherein an interlayer is formed in a layer which is at least either the soft magnetic layer or the ferromagnetic layer,

the interlayer has magnetism and has higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed, and

the interlayer contains at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and platinum.

21. A thin film magnetic head having a magnetic transducer,

a nonmagnetic layer having a pair of surfaces opposing each other;

a soft magnetic layer formed on one surface of the nonmagnetic layer;

a ferromagnetic layer formed on the other surface of the nonmagnetic layer;

an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer;

an interlayer formed in a layer which is at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed; and

an inserted layer formed at least either between the interlayer and the nonmagnetic layer or on the side opposite to the nonmagnetic layer with respect to the interlayer, the inserted layer containing at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and platinum.

22. A thin film magnetic head having a magnetic transducer,

the magnetic transducer comprising:

a nonmagnetic layer having a pair of surfaces opposing each other;

a soft magnetic layer formed on one surface of the nonmagnetic layer;

a ferromagnetic layer formed on the other surface of the nonmagnetic layer;

an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer;

an interlayer formed in at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having

higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed; and

a thermal stabilization layer formed at least either between the interlayer and the nonmagnetic layer or on the side opposite to the nonmagnetic layer with respect to the interlayer.

23. A method of manufacturing a magnetic transducer comprising: a nonmagnetic layer having a pair of surfaces opposing each other; a soft magnetic layer formed on one surface of the nonmagnetic layer; a ferromagnetic layer formed on the other surface of the nonmagnetic layer; and an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer, the method including the step of:

forming an interlayer in a layer which is at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed, the interlayer containing at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and platinum.

24. A method of manufacturing a magnetic transducer according to claim 23, wherein the step of forming the interlayer includes the steps of:

forming a metal layer made of at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and

platinum in the layer in which the interlayer is formed; and

performing at least one of oxidizing process and nitriding process to a part of at least either the soft magnetic layer or the ferromagnetic layer and the metal layer.

25. A method of manufacturing a magnetic transducer comprising: a nonmagnetic layer having a pair of surfaces opposing each other; a soft magnetic layer formed on one surface of the nonmagnetic layer; a ferromagnetic layer formed on the other surface of the nonmagnetic layer; and an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer, the method including the steps of:

forming an interlayer in a layer which is at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed; and

forming an inserted layer at least either between the interlayer and the nonmagnetic layer or on the side opposite to the nonmagnetic layer with respect to the interlayer, the inserted layer containing at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and platinum.

26. A method of manufacturing a thin film magnetic head having

a magnetic transducer comprising: a nonmagnetic layer having a pair of surfaces opposing each other; a soft magnetic layer formed on one surface of the nonmagnetic layer; a ferromagnetic layer formed on the other surface of the nonmagnetic layer; and an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer, the method including the step of:

forming an interlayer in a layer which is at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed, the interlayer containing at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and platinum.

27. A method of manufacturing a thin film magnetic head having a magnetic transducer comprising: a nonmagnetic layer having a pair of surfaces opposing each other; a soft magnetic layer formed on one surface of the nonmagnetic layer; a ferromagnetic layer formed on the other surface of the nonmagnetic layer; and an antiferromagnetic layer formed on the ferromagnetic layer on the side opposite to the nonmagnetic layer, the method including the steps of:

forming an interlayer in a layer which is at least either the soft magnetic layer or the ferromagnetic layer, the interlayer having magnetism and having higher electrical resistance than the electrical resistance of at least a part of the layer in which the interlayer is formed;

and

forming an inserted layer at least either between the interlayer and the nonmagnetic layer or on the side opposite to the nonmagnetic layer with respect to the interlayer, the inserted layer containing at least one element in a group consisting of manganese, chromium, nickel, copper, rhodium, iridium and platinum.

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